



Complete Summary

GUIDELINE TITLE

ACR Appropriateness Criteria™ for metastatic bone disease.

BIBLIOGRAPHIC SOURCE(S)

el-Khoury GY, Dalinka MK, Alazraki N, Berquist TH, Daffner RH, DeSmet AA, Goergen TG, Keats TE, Manaster BJ, Newberg A, Pavlov H, Haralson RH, McCabe JB, Sartoris D. Metastatic bone disease. American College of Radiology. ACR Appropriateness Criteria. Radiology 2000 Jun; 215(Suppl):283-93. [33 references]

COMPLETE SUMMARY CONTENT

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RECOMMENDATIONS
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SCOPE

DISEASE/CONDITION(S)

Metastatic bone disease

GUIDELINE CATEGORY

Diagnosis

CLINICAL SPECIALTY

Nuclear Medicine
Oncology
Radiology

INTENDED USERS

Health Plans
Hospitals
Managed Care Organizations

Physicians
Utilization Management

GUIDELINE OBJECTIVE(S)

To evaluate the appropriateness of initial radiologic examinations for metastatic bone disease.

TARGET POPULATION

Patients with metastatic bone disease

INTERVENTIONS AND PRACTICES CONSIDERED

1. Bone survey
2. Ultrasound
3. Conventional tomography
4. Computed tomography myelography
5. Computed tomography of back or hip
6. Magnetic resonance imaging
7. Magnetic resonance imaging and gadolinium
8. Thin needle aspiration
9. Core biopsy
10. Myelography
11. Bone scan
12. Radiography of the lumbar spine, back, hip, hot areas, sternum
13. Single photon emission computed tomography of back or hip
14. Whole-body fast STIR magnetic resonance imaging

MAJOR OUTCOMES CONSIDERED

Utility of radiologic examinations in differential diagnosis

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The guideline developer performed literature searches of recent peer-reviewed medical journals, primarily using the National Library of Medicine's MEDLINE database. The developer identified and collected the major applicable articles.

NUMBER OF SOURCE DOCUMENTS

The total number of source documents identified as the result of the literature search is not known.

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Expert Consensus (Delphi Method)
Weighting According to a Rating Scheme (Scheme Not Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

One or two topic leaders within a panel assume the responsibility of developing an evidence table for each clinical condition, based on analysis of the current literature. These tables serve as a basis for developing a narrative specific to each clinical condition.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus (Delphi)

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Since data available from existing scientific studies are usually insufficient for meta-analysis, broad-based consensus techniques are needed to reach agreement in the formulation of the Appropriateness Criteria. Serial surveys are conducted by distributing questionnaires to consolidate expert opinions within each panel. These questionnaires are distributed to the participants along with the evidence table and narrative as developed by the topic leader(s). Questionnaires are completed by the participants in their own professional setting without influence of the other members. Voting is conducted using a scoring system from 1-9, indicating the least to the most appropriate imaging examination or therapeutic procedure. The survey results are collected, tabulated in anonymous fashion, and redistributed after each round. A maximum of three rounds is conducted and opinions are unified to the highest degree possible. Eighty (80) percent agreement is considered a consensus. If consensus cannot be reached by this method, the panel is convened and group consensus techniques are utilized. The strengths and weaknesses of each test or procedure are discussed and consensus reached whenever possible.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Criteria developed by the Expert Panels are reviewed by the American College of Radiology (ACR) Committee on Appropriateness Criteria and the Chair of the ACR Board of Chancellors.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

ACR Appropriateness Criteria™

Clinical Condition: Metastatic Bone Disease

Variant 1: Stage 1 carcinoma of the breast. Initial presentation: asymptomatic.

Radiologic Exam Procedure	Appropriateness Rating	Comments
Bone survey	1	
Ultrasound	1	
Conventional tomography	1	
Computed tomography myelography	1	
Magnetic resonance imaging	1	
Magnetic resonance imaging and gadolinium	1	
Thin needle aspiration	1	
Core biopsy	1	
Myelography	1	
Bone scan	1	
<u>Appropriateness Criteria Scale</u>		

1 2 3 4 5 6 7 8 9
1=Least appropriate 9=Most appropriate

Variant 2: Stage 2 carcinoma of the breast. Initial presentation, with back and hip pain.

Radiologic Exam Procedure	Appropriateness Rating	Comments
Radiograph of back	9	
Radiograph of hip	9	
Bone scan	9	
Bone survey	1	
Computed tomography of hip and back	1	
Ultrasound	1	
Computed tomography of back	1	
Computed tomography of hip	1	
Computed tomography - myelography	1	
Single photon emission computed tomography of back	1	
Single photon emission computed tomography of hip	1	
Magnetic resonance imaging and gadolinium	1	
Myelography	1	
Magnetic resonance imaging	1	
<u>Appropriateness Criteria Scale</u> 1 2 3 4 5 6 7 8 9 1=Least appropriate 9=Most appropriate		

Clinical Condition: Metastatic Bone Disease

Variant 3: Breast carcinoma. Follow-up bone scan reveals single hot lesion in spine.

Radiologic Exam Procedure	Appropriateness Rating	Comments
Magnetic resonance imaging	9	If x-ray is negative.
Radiograph of hot area	9	
Ultrasound	1	
Computed tomography - myelography	1	
Magnetic resonance imaging and gadolinium	1	
Thin needle aspiration	1	
Core biopsy	1	
Myelography	1	
Bone survey	1	
Computed tomography	1	May be needed for biopsy localization.
<p style="text-align: center;"><u>Appropriateness Criteria Scale</u></p> <p style="text-align: center;">1 2 3 4 5 6 7 8 9</p> <p style="text-align: center;">1=Least appropriate 9=Most appropriate</p>		

Variant 4: Breast carcinoma. Three hot areas in spine (bone scan). No back pain.

Radiologic Exam Procedure	Appropriateness Rating	Comments
Radiograph of hot areas	9	
Magnetic resonance imaging	9	If plain films are negative.
Conventional tomography	1	
Bone survey	1	

Ultrasound	1	
Computed tomography - myelography	1	
Single photon emission computed tomography	1	Single photon emission computed tomography added to bone scan in equivocal lesions.
Magnetic resonance imaging and gadolinium	1	
Thin needle aspiration	1	
Core biopsy	1	
Myelography	1	
Computed tomography - hot areas	1	Necessary if biopsy is to be performed.
<p align="center"><u>Appropriateness Criteria Scale</u></p> <p align="center">1 2 3 4 5 6 7 8 9</p> <p align="center">1=Least appropriate 9=Most appropriate</p>		

Clinical Condition: Metastatic Bone Disease

Variant 5: History of treated breast carcinoma. Now has single hot lesion in sternum.

Radiologic Exam Procedure	Appropriateness Rating	Comments
Radiograph of sternum	9	
Computed tomography	9	Important for diagnosis and for use in localization if biopsy is required.
Bone survey	1	
Conventional tomography	1	
Ultrasound	1	
Magnetic resonance imaging	1	
Magnetic resonance imaging and gadolinium	1	
Myelography	1	

<u>Appropriateness Criteria Scale</u>		
1 2 3 4 5 6 7 8 9		
1=Least appropriate 9=Most appropriate		

Variant 6: Patient with known bone metastatic disease (carcinoma of the breast). Presenting with pathological fracture of left femur on x-ray.

Radiologic Exam Procedure	Appropriateness Rating	Comments
Bone scan	9	
Bone survey	1	
Radiography	1	
Ultrasound	1	
Computed tomography	1	
Magnetic resonance imaging	1	
Magnetic resonance imaging and gadolinium	1	
Thin needle aspiration	1	
Core biopsy	1	
Single photon emission computed tomography	1	

<u>Appropriateness Criteria Scale</u>		
1 2 3 4 5 6 7 8 9		
1=Least appropriate 9=Most appropriate		

Clinical Condition: Metastatic Bone Disease

Variant 7: Prostate nodule on physical exam, proven to be carcinoma. Prostate specific antigen less than 10 mg/ml. Patient asymptomatic.

Radiologic Exam Procedure	Appropriateness Rating	Comments
Bone survey	1	

Ultrasound	1	
Computed tomography	1	
Magnetic resonance imaging	1	
Magnetic resonance imaging and gadolinium	1	
Myelography	1	
Bone scan	1	
<p align="center"><u>Appropriateness Criteria Scale</u></p> <p align="center">1 2 3 4 5 6 7 8 9</p> <p align="center">1=Least appropriate 9=Most appropriate</p>		

Variant 8: Prostate nodule on physical exam, proven to be carcinoma.
Prostate specific antigen greater than 20 mg/ml. Patient asymptomatic.

Radiologic Exam Procedure	Appropriateness Rating	Comments
Bone scan	9	
Bone survey	1	
Ultrasound	1	
Computed tomography	1	
Magnetic resonance imaging	1	
Magnetic resonance imaging and gadolinium	1	
Myelography	1	
<p align="center"><u>Appropriateness Criteria Scale</u></p> <p align="center">1 2 3 4 5 6 7 8 9</p> <p align="center">1=Least appropriate 9=Most appropriate</p>		

Clinical Condition: Metastatic Bone Disease

Variant 9: Elderly patient with known malignancy, with back pain and partially collapsed vertebra on plain radiography. Otherwise healthy.

Radiologic Exam Procedure	Appropriateness Rating	Comments
Magnetic resonance imaging	9	Differentiate osteoporotic collapse vs. destructive lesion.
Bone survey	1	
Radiography	1	
Ultrasound	1	
Magnetic resonance imaging and gadolinium	1	
Core biopsy	1	
Myelography	1	
Computed tomography	1	May be used for biopsy localization.
Bone scan	No Consensus	Identify presence of multifocal disease or identify site for biopsy.
<p align="center"><u>Appropriateness Criteria Scale</u></p> <p align="center">1 2 3 4 5 6 7 8 9</p> <p align="center">1=Least appropriate 9=Most appropriate</p>		

Variant 10: 1 cm lung nodule. Non-small cell at needle biopsy. Now coming for staging and resection.

Radiologic Exam Procedure	Appropriateness Rating	Comments
Bone scan	9	
Bone survey	1	
Ultrasound	1	
Computed tomography	1	
Magnetic resonance imaging	1	
Magnetic resonance imaging and gadolinium	1	
<p align="center"><u>Appropriateness Criteria Scale</u></p>		

1 2 3 4 5 6 7 8 9
1=Least appropriate 9=Most appropriate

Clinical Condition: Metastatic Bone Disease

Variant 11: Patient with multiple myeloma presenting with acute low back pain.

Radiologic Exam Procedure	Appropriateness Rating	Comments
Lumbar spine radiograph	9	
Ultrasound	1	
Computed tomography	1	
Bone scan	1	Single photon emission computed tomography added to bone scan in equivocal lesions. Indicated if strontium (Sr89) treatment is indicated.
Magnetic resonance imaging and gadolinium	1	
Myelography	1	
Bone survey	No Consensus	Depends on length of interval since last bone survey.
Magnetic resonance imaging	No Consensus	Majority felt probably not indicated.
<u>Appropriateness Criteria Scale</u> 1 2 3 4 5 6 7 8 9 1=Least appropriate 9=Most appropriate		

Variant 12: Young patient with osteosarcoma of long bone coming for staging. Chest computed tomography normal. Looking for bone metastases.

Radiologic Exam Procedure	Appropriateness Rating	Comments
Bone scan	9	
Bone survey	1	

Ultrasound	1	
Computed tomography	1	
Bone scan - single photon computed tomography	1	Single photon emission computed tomography added to nuclear medicine in equivocal lesions.
Magnetic resonance imaging	1	
Magnetic resonance imaging and gadolinium	1	
<p align="center"><u>Appropriateness Criteria Scale</u></p> <p align="center">1 2 3 4 5 6 7 8 9</p> <p align="center">1=Least appropriate 9=Most appropriate</p>		

Clinical Condition: Metastatic Bone Disease

Variant 13: Osteosarcoma, resected clear margins. Chemotherapy, asymptomatic. Six-month follow-up after treatment to rule out bone metastases.

Radiologic Exam Procedure	Appropriateness Rating	Comments
Bone scan	9	
Bone survey	1	
Ultrasound	1	
Computed tomography	1	
Bone scan - single photon emission computed tomography	1	
Magnetic resonance imaging	1	
Magnetic resonance imaging and gadolinium	1	
<p align="center"><u>Appropriateness Criteria Scale</u></p> <p align="center">1 2 3 4 5 6 7 8 9</p> <p align="center">1=Least appropriate 9=Most appropriate</p>		

Variant 14: Elderly female with known primary, now presenting with acute vertebral collapse by plain x-ray and computed tomography.

Radiologic Exam Procedure	Appropriateness Rating	Comments
Bone scan	9	
Magnetic resonance imaging	9	
Bone survey	2	
Magnetic resonance imaging and gadolinium	2	
Myelography	2	
<u>Appropriateness Criteria Scale</u> 1 2 3 4 5 6 7 8 9 1=Least appropriate 9=Most appropriate		

Variant 15: Female, 8 weeks pregnant, with known primary, now suspected of having bone metastasis. She wants to continue with the pregnancy.

Radiologic Exam Procedure	Appropriateness Rating	Comments
Radiography	9	
Whole-body fast STIR magnetic resonance imaging	9	
Computed tomography	2	
Bone scan	2	
Bone survey	2	
<u>Appropriateness Criteria Scale</u> 1 2 3 4 5 6 7 8 9 1=Least appropriate 9=Most appropriate		

Summary

There are several imaging and interventional techniques for the initial detection and follow-up of metastatic bone disease: radionuclide bone scanning, plain radiography, computed tomography, magnetic resonance imaging, thin needle aspiration, and core needle biopsy.

Except for few limitations radionuclide bone scanning is the primary imaging examination used to detect osseous metastasis. It has been repeatedly shown to be more sensitive than plain radiography. Bone scans are sensitive in detecting osseous abnormalities, but they are nonspecific. After an abnormality has been detected, it should be radiographed to make sure it does not represent a benign process such as osteoarthritis, inflammatory arthritis or fracture. One of the major advantages of radionuclide bone scanning is that it allows for a total body survey. This is important because approximately 13% of metastatic lesions occur in the appendicular skeleton in regions that are usually not included on a skeletal survey. The most metastatic skeletal lesions could be asymptomatic and that serum alkaline phosphatase level is a poor indicator of early metastases. Highly aggressive metastases may show "cold" or photopenic areas on a bone scan. Multiple myeloma can frequently show photopenic lesions or a negative bone scan. Bone scans are also insensitive in the detection of skeletal lesions due to histiocytosis X, and radiographic surveys are recommended for patients with this disease. Diffuse bony metastasis may present with a pattern of intense uniform radionuclide uptake (superscan), which can be misinterpreted as a negative examination.

Solitary sites of increased radionuclide uptake in patients with known malignancy are a common occurrence and they could pose a diagnostic problem because of the nonspecific nature of these abnormalities on bone scintigraphy. On the other hand, it has been reported that approximately 21% of patients with breast cancer relapsed with a solitary bone lesion, most commonly in the spine. The spine was the most common site for both solitary and multiple metastases. It has been reported that solitary rib metastasis in cancer patients are uncommon and that 90% of hot rib lesions on bone scan are due to benign causes. A solitary sternal hot lesion in a patient with breast carcinoma has an 80% probability of being due to metastatic disease. When a patient with a known primary tumor develops a solitary lesion on a bone scan, further diagnostic evaluation should be undertaken, starting with plain radiography and, if not diagnostic, proceeding to computed tomography, magnetic resonance, or even biopsy. Some authors advocated single photon emission computed tomography imaging as an effective method for differentiating malignant from benign lesions in the spine.

In stage 1 breast carcinoma where bone scintigraphy is usually negative, most authorities believe that routine baseline and follow-up bone scans are probably unwarranted because of the very low true positive yield. The panel does not recommend any imaging studies for the skeleton in patients with stage 1 carcinoma of the breast when they present initially. Bone scanning is useful in the preoperative staging and postoperative follow-up of stages 2, 3, and 4 breast carcinoma. If a patient with stage 2 breast carcinoma presents with back and hip pain, the panel recommends plain radiography of the back and hip and radionuclide bone scan. Other studies may be needed depending on the results of the plain radiographs and bone scan. In patients with known breast carcinoma, who are discovered to have a single hot area in the spine on bone scan, the panel recommends plain radiography of the hot area. If plain radiography is negative,

the panel recommends magnetic resonance imaging. For lesion localization and needle guidance, a computed tomography scan is recommended if a needle biopsy is warranted. The panel recommends adding single photon emission computed tomography imaging if the planar radionuclide bone scan is equivocal. In patients discovered to have multiple hot lesions in the spine, the panel recommends plain radiography of the hot lesions; magnetic resonance imaging is also recommended if the radiographic examination is negative. A computed tomography scan becomes necessary if a needle biopsy is to be performed.

For a hot lesion of the sternum in a patient with known breast carcinoma, the panel recommends plain radiography, followed by computed tomography to help in the diagnosis and for localization if thin needle aspiration or core biopsy is required.

In a patient with known metastatic carcinoma presents with a pathological fracture of a long bone on plain radiography, the panel recommends a radionuclide bone scan to look for other metastatic sites in the skeleton.

Recent studies have shown that for staging and follow-up of patients with prostate carcinoma, radionuclide bone scans are not necessary unless the prostate specific antigen is above 20 ng/ml. The panel agrees with these studies and for patients discovered to have a prostate carcinoma and prostate specific antigen less than 20 ng/ml, it does not recommend any imaging studies for the skeletal system. The panel, however, recommends a radionuclide bone scan for patients with prostate specific antigen above 20 ng/ml.

In patients with non-small cell carcinoma of the lung, bone is one of the most common sites for early extrathoracic spread. Some of these bony metastases could be asymptomatic. The exclusion of bone metastases is important in the initial preoperative staging of lung cancer, although it is not clear from the literature whether bone scans should be performed routinely or only when clinical indicators suggest skeletal metastases. The panel recommends no imaging studies for the skeleton in patients coming for staging after needle biopsy of a lung nodule revealed a non-small cell carcinoma.

Bone metastases are very uncommon at initial presentation in patients with primary malignant bone tumors; therefore radionuclide bone scan is not indicated. Bone scanning was shown not to be useful in differentiating between benign and malignant lesions or in defining reliably the local extent of a malignant tumor. Osteosarcoma is probably the only exception; although the yield of imaging for metastases at the time of diagnosis is small, the presence of an occasional metastasis could substantially affect the treatment of the patient. The panel concurs with these reports and it recommends a radionuclide bone scan for patients with osteosarcoma at presentation for staging. In patients with osteosarcoma who received adjuvant chemotherapy, 16% may develop asymptomatic osseous metastasis before lung metastasis; therefore some authors suggest bone scans for routine follow-up. The panel concurs with these reports and it recommends a radionuclide bone scan for patients with osteosarcoma at follow-up and after tumor resection with clear margins and chemotherapy.

In patients with cancers that rarely metastasize to bone such as cervical, endometrial, bladder, and gastrointestinal tract tumors, baseline scans are

obtained only when the disease is advanced. There is no consensus in the literature about the timing of follow-up scans in asymptomatic patients. Some authors suggest a bone scan every 6 months for 1 year and then every 2 years. In clinical practice, most medical and radiation oncologists request follow-up bone scans only (a) in asymptomatic patients with evidence of progressive disease, i.e., rising carcinoembryonic antigen or alkaline phosphatase values, (b) restaging the disease in patients with local recurrence, and (c) in patients with symptoms that are potentially of osseous origin.

Plain radiography is frequently used to screen for metastatic sites in multiple myeloma and histiocytosis X, but generally it is considered insensitive to screen for asymptomatic metastases. In patients with multiple myeloma who present with acute low-back pain, the panel recommends plain radiographs of the lumbosacral spine or bone survey if the interval since the last bone survey is long. Most of the panel also believed that magnetic resonance imaging is probably not indicated in this clinical situation unless the patient has neurological findings. The panel believed that the only time where radionuclide bone scan (with or without single photon emission computed tomography) would be needed in multiple myeloma is when strontium 89 treatment is being considered.

The vertebral column deserves special consideration. It is the most common site of skeletal metastasis, and cord compression from metastasis is among the most dreaded complications of cancer. Magnetic resonance imaging has proven advantages over all other imaging modalities, including myelography and myelocomputed tomography. One limitation with magnetic resonance imaging has been its inability to differentiate an acute traumatic or acute osteopenic compression fracture from a pathologic fracture. However, recently diffusion-weighted magnetic resonance imaging has been shown to be effective in differentiating benign osteopenic vertebral collapse from malignant collapse.

As magnetic resonance sequences continue to become faster, there is emerging evidence showing that whole-body fast STIR magnetic resonance imaging is feasible and it can replace bone scintigraphy for the detection of metastatic bone disease. Proponents of this technique indicate that whole-body magnetic resonance imaging is more sensitive and more specific than bone scintigraphy. Whole-body magnetic resonance imaging is also comparable in cost to bone scintigraphy. There is no ionizing radiation involved with whole-body magnetic resonance imaging, making this technique especially suited for pregnant patients with suspected bony metastasis.

Depending on whether the lesion is lytic, blastic, or associated with a soft tissue mass, thin needle aspiration or core biopsy can be used to arrive at a definitive diagnosis in patients suspected with metastasis of known or unknown origin. Needle biopsy is also helpful in suspected tumor recurrence and also to differentiate metastasis from osteonecrosis in previously irradiated bone.

CLINICAL ALGORITHM(S)

Algorithms were not developed from criteria guidelines.

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The recommendations are based on analysis of the current literature and expert panel consensus.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Appropriate selection of radiologic exam procedures to evaluate metastatic bone disease.

POTENTIAL HARMS

None identified

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

An American College of Radiology (ACR) Committee on Appropriateness Criteria and its expert panels have developed criteria for determining appropriate imaging examinations for diagnosis and treatment of specified medical condition(s). These criteria are intended to guide radiologists, radiation oncologists, and referring physicians in making decisions regarding radiologic imaging and treatment. Generally, the complexity and severity of a patient's clinical condition should dictate the selection of appropriate imaging procedures or treatments. Only those exams generally used for evaluation of the patient's condition are ranked. Other imaging studies necessary to evaluate other co-existent diseases or other medical consequences of this condition are not considered in this document. The availability of equipment or personnel may influence the selection of appropriate imaging procedures or treatments. Imaging techniques classified as investigational by the U.S. Food and Drug Administration (FDA) have not been considered in developing these criteria; however, study of new equipment and applications should be encouraged. The ultimate decision regarding the appropriateness of any specific radiologic examination or treatment must be made by the referring physician and radiologist in light of all the circumstances presented in an individual examination.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Living with Illness

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

el-Khoury GY, Dalinka MK, Alazraki N, Berquist TH, Daffner RH, DeSmet AA, Goergen TG, Keats TE, Manaster BJ, Newberg A, Pavlov H, Haralson RH, McCabe JB, Sartoris D. Metastatic bone disease. American College of Radiology. ACR Appropriateness Criteria. Radiology 2000 Jun;215(Suppl):283-93. [33 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

1995 (revised 1999)

GUIDELINE DEVELOPER(S)

American College of Radiology - Medical Specialty Society

SOURCE(S) OF FUNDING

The American College of Radiology (ACR) provided the funding and the resources for these ACR Appropriateness Criteria™.

GUIDELINE COMMITTEE

ACR Appropriateness Criteria™ Committee, Expert Panel on Musculoskeletal Imaging.

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline. It is a revision of a previously issued version (Appropriateness criteria for metastatic bone disease. Reston [VA]: American College of Radiology (ACR); 1995. 11 p. [ACR Appropriateness Criteria™]).

The ACR Appropriateness Criteria™ are reviewed after five years, if not sooner, depending upon introduction of new and highly significant scientific evidence. The next review date for this topic is 2004.

GUIDELINE AVAILABILITY

Electronic copies: Available from the [American College of Radiology \(ACR\) Web site](#).

Print copies: Available from ACR, 1891 Preston White Drive, Reston, VA 20191. Telephone: (703) 648-8900.

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on May 6, 2001. The information was verified by the guideline developer as of June 29, 2001.

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